

FIG. 1

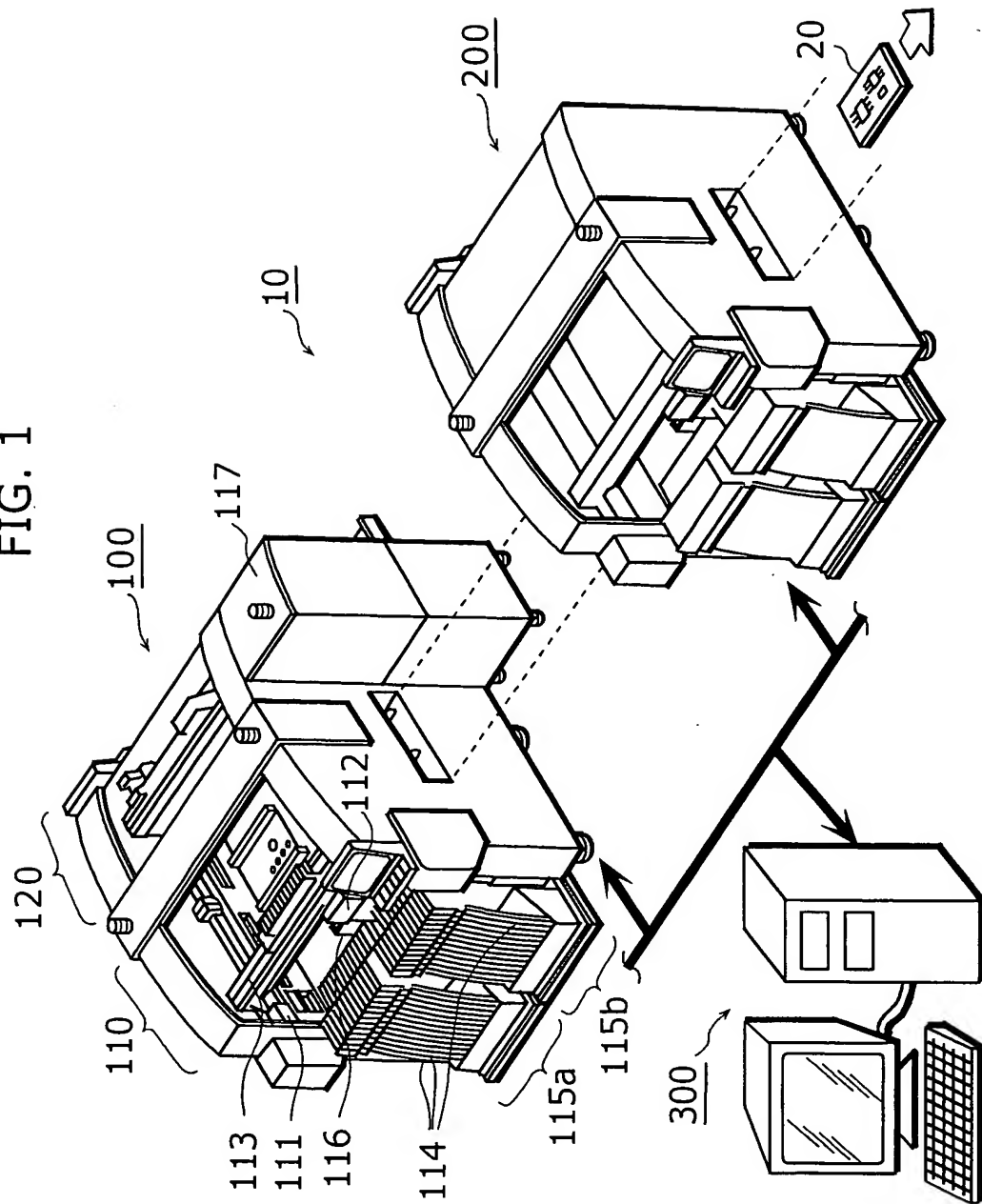


FIG. 2

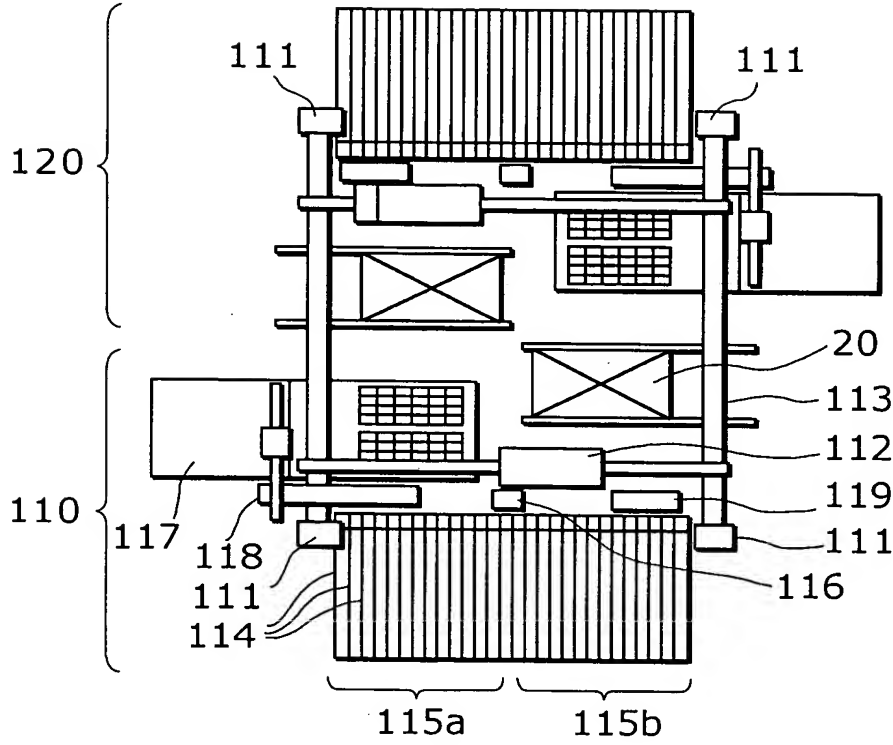


FIG. 3

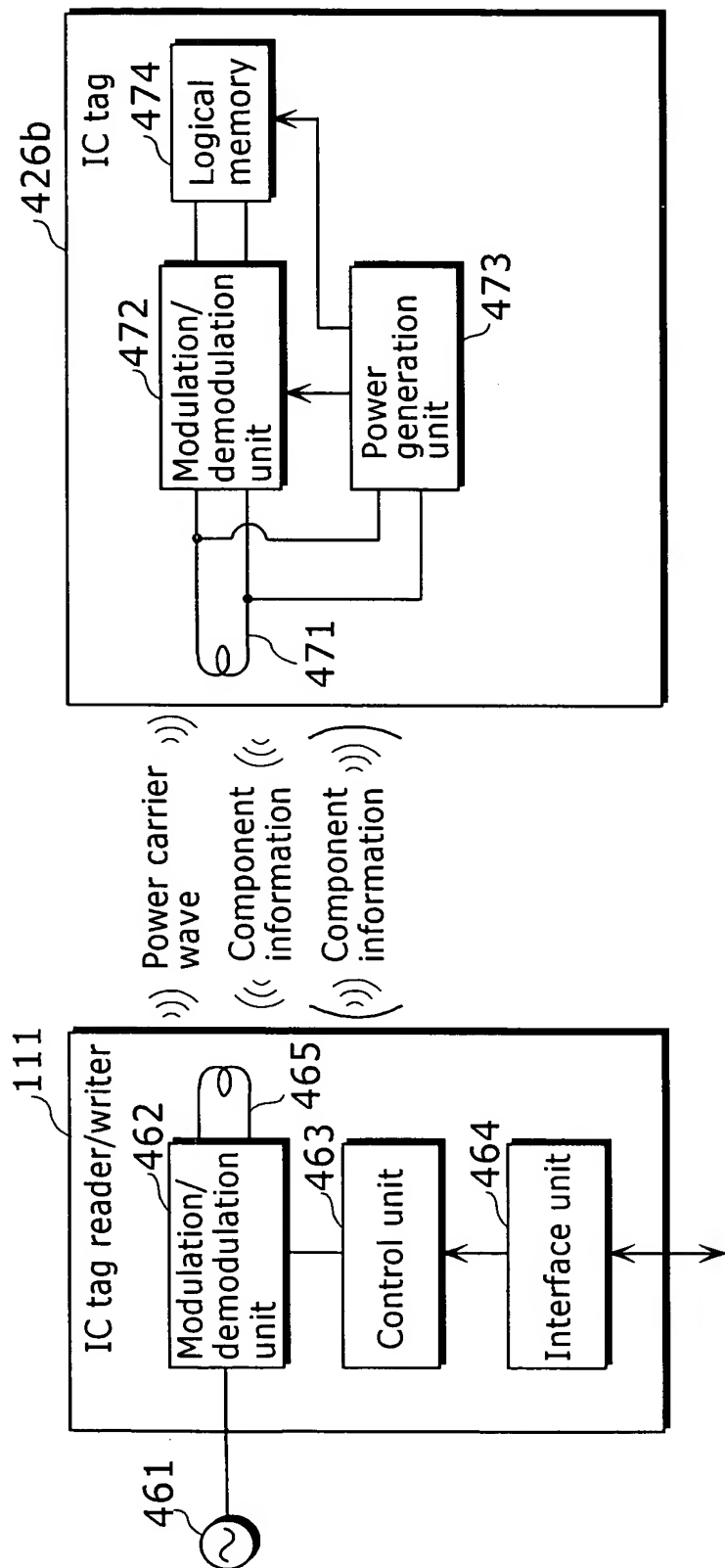
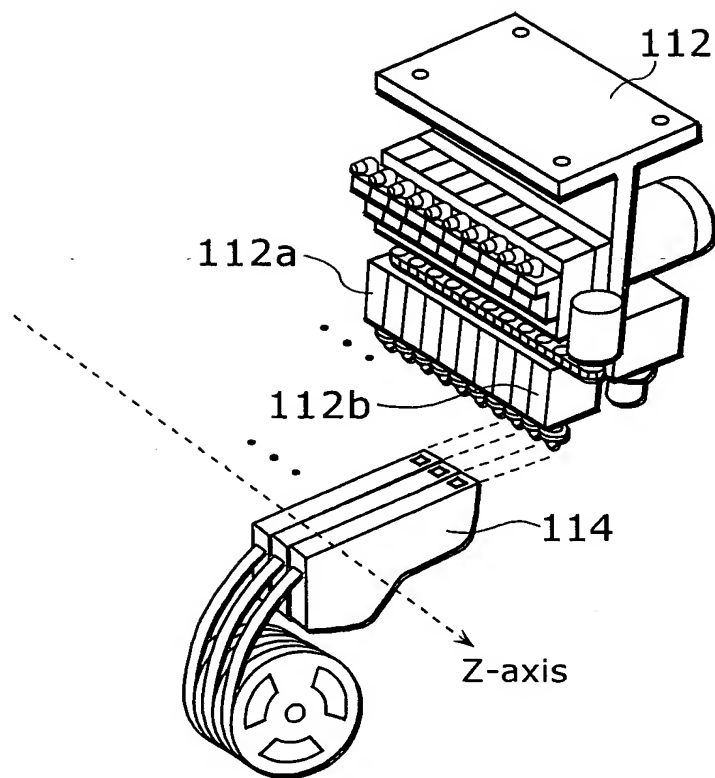


FIG. 4



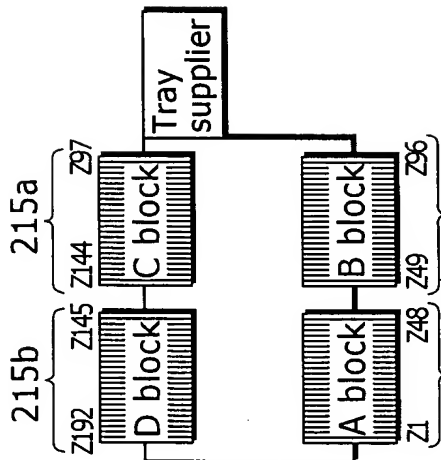


FIG. 5A

FIG. 5B

	A					B					C					D							
	Z1 Z48					Z49 Z96					Z97 Z144					Z145 Z192							
Component cassettes	Tape width	Z1	Z3	Z45	Z47	No. of tapes	Z49	Z51	Z93	Z95	No. of tapes	Z97	Z99	Z141	Z143	No. of tapes	Z145	Z147	Z189	Z191	No. of Z positions	Occupied consecutive positions	
	8(Double)	O	O	O	O	48	O	O	O	O	48	O	O	O	O	O	O	O	O	O	48	192	1
	8(Single)	O	O	O	O	24	O	O	O	O	24	O	O	O	O	O	O	O	O	O	24	96	1
	12	O	O	O	O	24	O	O	O	O	24	O	O	O	O	O	O	O	O	O	24	96	1
	16	O	O	O	O	12	O	O	O	O	12	O	O	O	O	O	12	O	O	O	12	48	2
	24	O	O	O	O	12	O	O	O	O	12	O	O	O	O	O	12	O	O	O	12	48	2
	32	O	O	O	O	12	O	O	O	O	12	O	O	O	O	O	12	O	O	O	12	48	2
	44	-	O	O	-	8	-	O	O	-	8	-	O	O	-	-	8	-	O	O	-	32	3
	56	-	O	O	-	6	-	O	O	-	6	-	O	O	-	-	6	-	O	O	-	24	4
72	-	O	O	-	6	-	O	O	-	6	-	O	O	-	-	6	-	O	O	-	24	4	

FIG. 6A

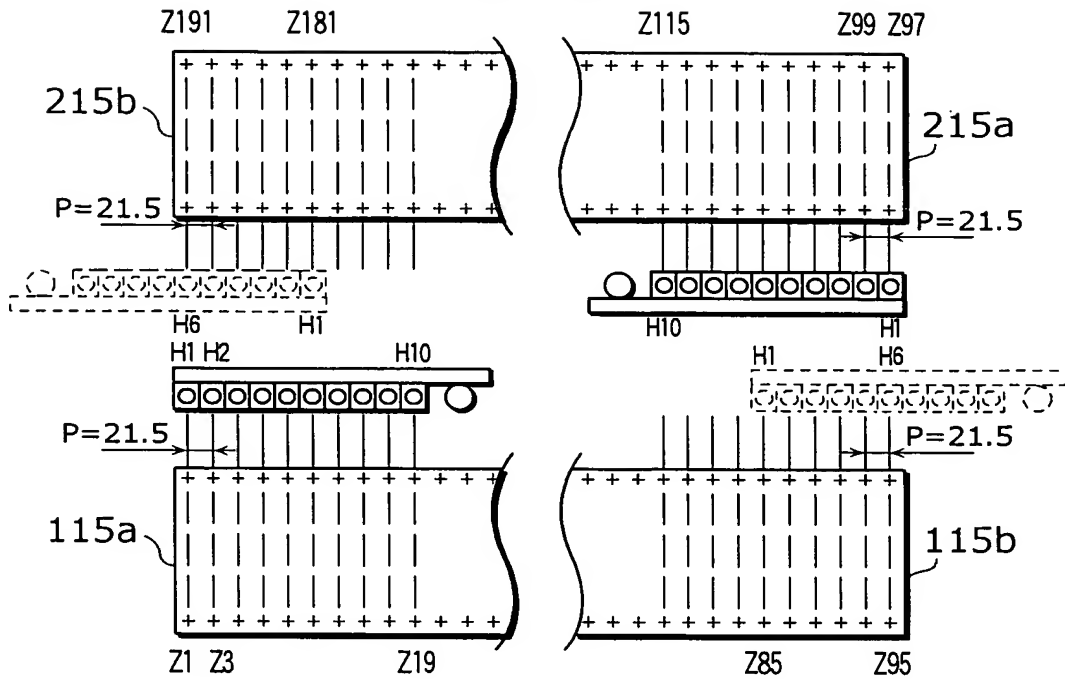


FIG. 6B

10 nozzle heads	Inner side	Z1 Z2	Z3 Z4	Z5 Z6	Z7 Z8	Z9 Z10	Z11 Z12	Z13 Z14	Z15 Z16	Z17 Z18	Z19 ~ Z86	Z87 Z88	Z89 Z90	Z91 Z92	Z93 Z94	Z95 Z96
	Outer side	Z97 Z98	Z99 Z100	Z101 Z102	Z103 Z104	Z105 Z106	Z107 Z108	Z109 Z110	Z111 Z112	Z113 Z114	Z115 ~ Z182	Z183 Z184	Z185 Z186	Z187 Z188	Z189 Z190	Z191 Z192
Heads (Nozzles)	H1	○	○	○	○	○	○	○	○	○	○	—	—	—	—	—
	H2	—	○	○	○	○	○	○	○	○	○	○	—	—	—	—
	H3	—	—	○	○	○	○	○	○	○	○	○	○	—	—	—
	H4	—	—	—	○	○	○	○	○	○	○	○	○	○	—	—
	H5	—	—	—	—	○	○	○	○	○	○	○	○	○	○	—
	H6	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○
	H7	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○
	H8	—	—	—	—	—	—	—	○	○	○	○	○	○	○	○
	H9	—	—	—	—	—	—	—	—	○	○	○	○	○	○	○
	H10	—	—	—	—	—	—	—	—	—	○	○	○	○	○	○

○ : Picking up possible

— : Picking up impossible

FIG. 7A

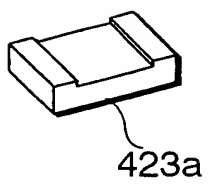


FIG. 7B

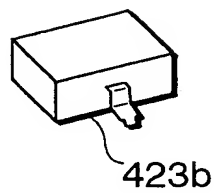


FIG. 7C

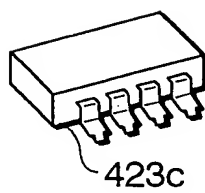


FIG. 7D

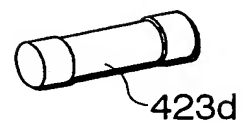


FIG. 8

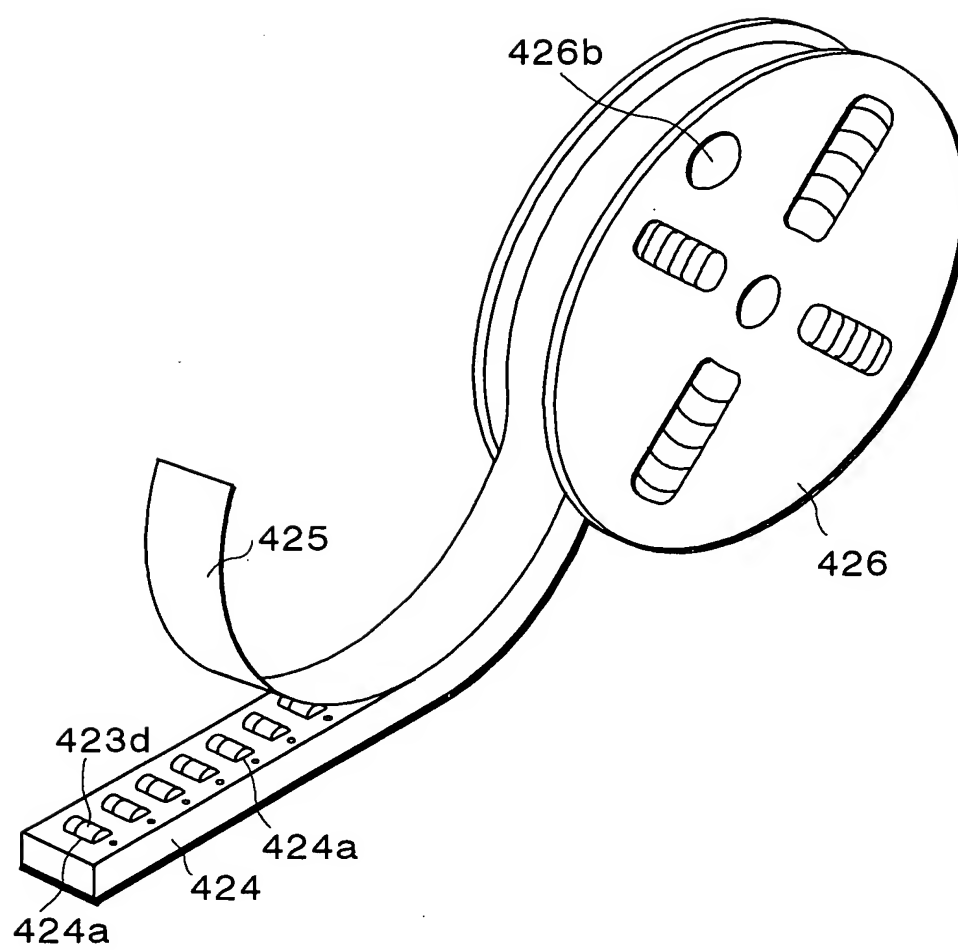
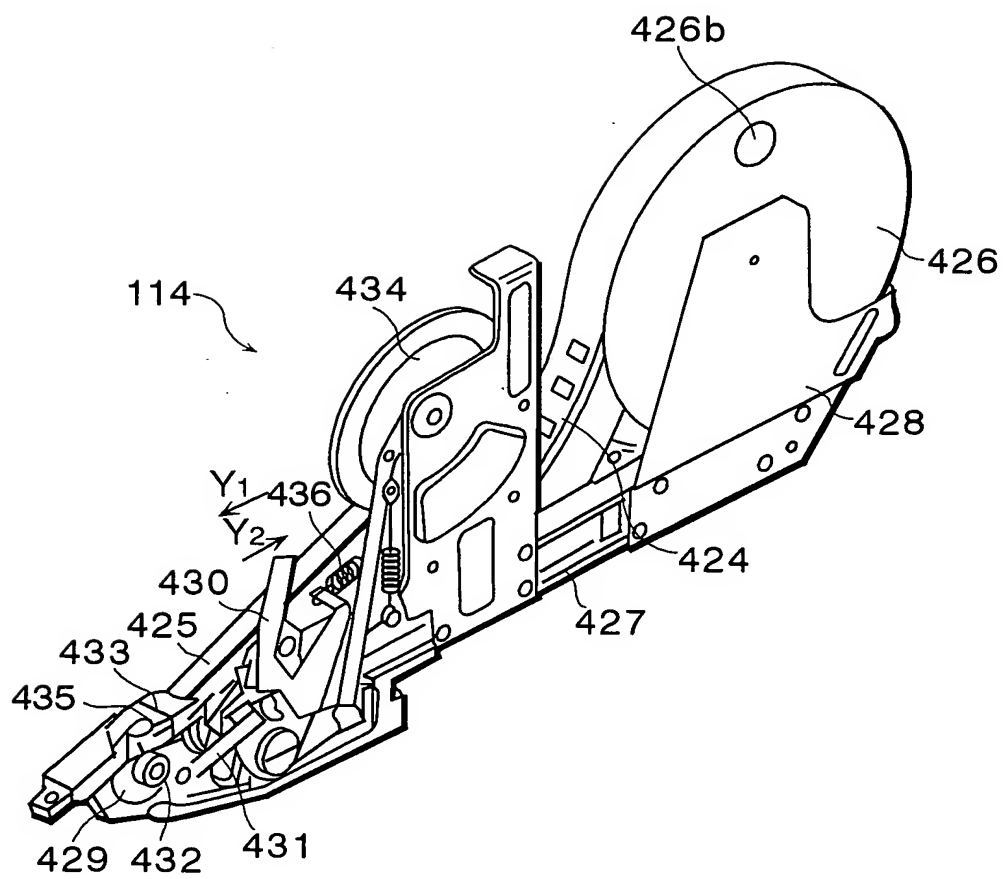


FIG. 9



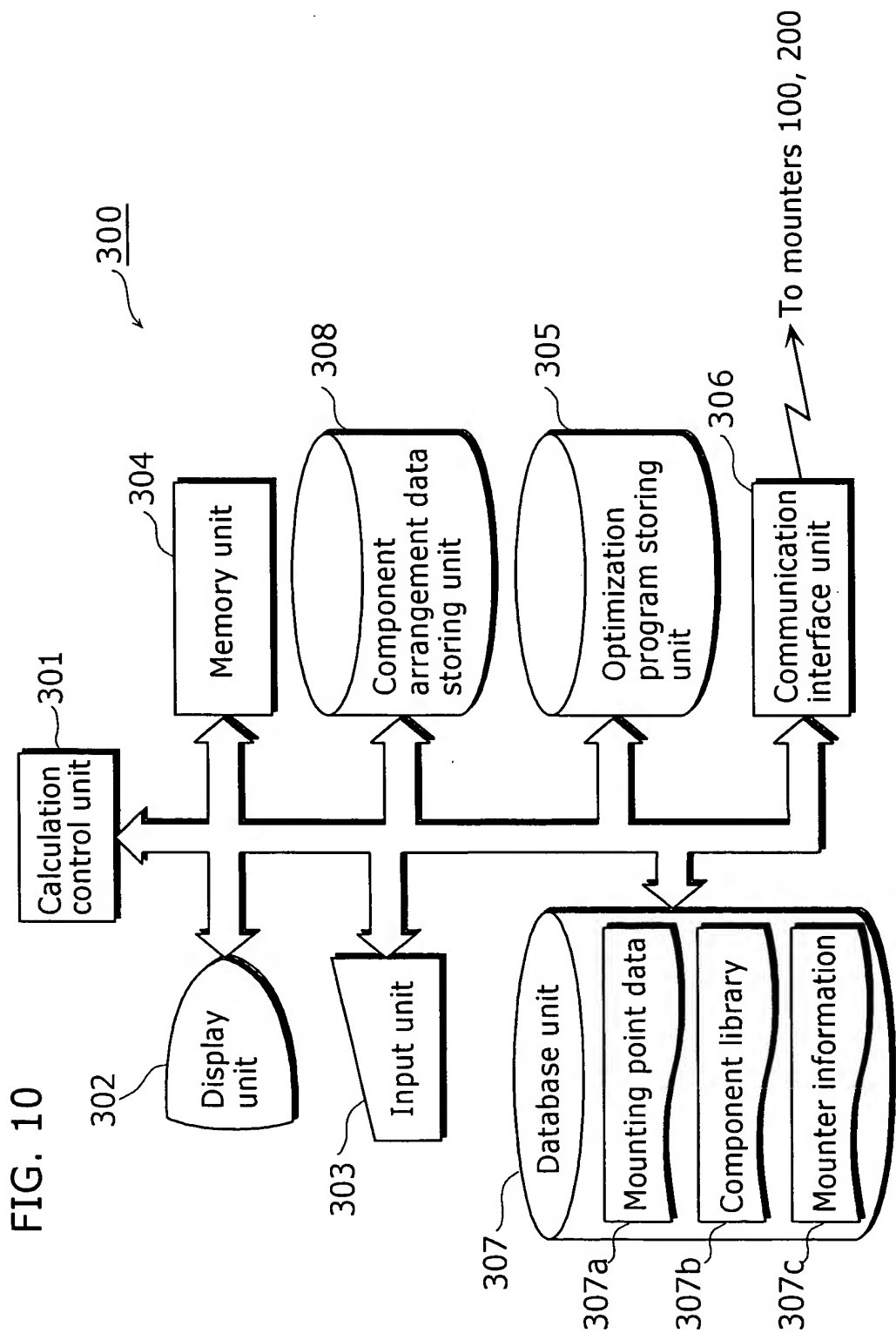


FIG. 10

FIG. 11

307a

Mounting points $p_i = (\text{Component type } C_i, \text{ X coordinate } X_i, \text{ Y coordinate } Y_i, \text{ Control data } \phi_i)$



$$\text{NC data} = \begin{pmatrix} p_1 \\ p_2 \\ p_3 \\ \vdots \\ \vdots \\ \vdots \\ p_N \end{pmatrix} = \begin{pmatrix} c_1, x_1, y_1, \phi_1 \\ c_2, x_2, y_2, \phi_2 \\ c_3, x_3, y_3, \phi_3 \\ \vdots \\ \vdots \\ \vdots \\ c_N, x_N, y_N, \phi_N \end{pmatrix}$$

FIG. 12

307b










Component name	(Appearance)	Component size (mm)			2-D recognition method	Pick-up nozzle	Tact time (sec.)	Speed XY	
		X	Y	L					
0603CR		0.6	0.3	0.25	Reflection	SX	0.086	1	
1005CR		1.0	0.5	0.3-0.5		SA			
1608CR		1.6	0.8	0.4-0.8		S	0.094		
2012CR		2.0	1.25	0.4-0.8					
3216CR		3.2	1.6	0.4-0.8					
4TR		2.8	2.8	1.1		Cylindrical tip	0.11		
6TR		4.3	4.5	1.5					
1TIP		2.0	φ1.0	-					
2TIP		3.6	φ1.4	-					
1CAP		3.8	1.9	1.6		S			
2CAP		4.7	2.6	2.1					
3CAP		6.0	3.2	2.5		M			
4CAP		7.3	4.3	2.8					
SCAP		4.3	4.3	6.0					
LCAP		6.6	6.6	6.0		ML			
LLCAP		10.3	10.3	10.5					
1VOL		4.5	3.8	1.6-2.4		M	0.13	2	
2VOL		3.7	3.0	1.6					
3VOL		4.8	4.0	3.0					

FIG. 13

307c

Unit ID	Head information	Nozzle information	Cassette information	Tray information
110	10 nozzle heads	SX,SA,...	96	8 levels
120	10 nozzle heads	None	96	None
210	4 nozzle heads	S,M,...	48	None

FIG. 14

Component name	Unit ID	Z number
0603CR	110	5
1005CR	120	8
1608CR	210	4
2012CR	120	22

FIG. 15

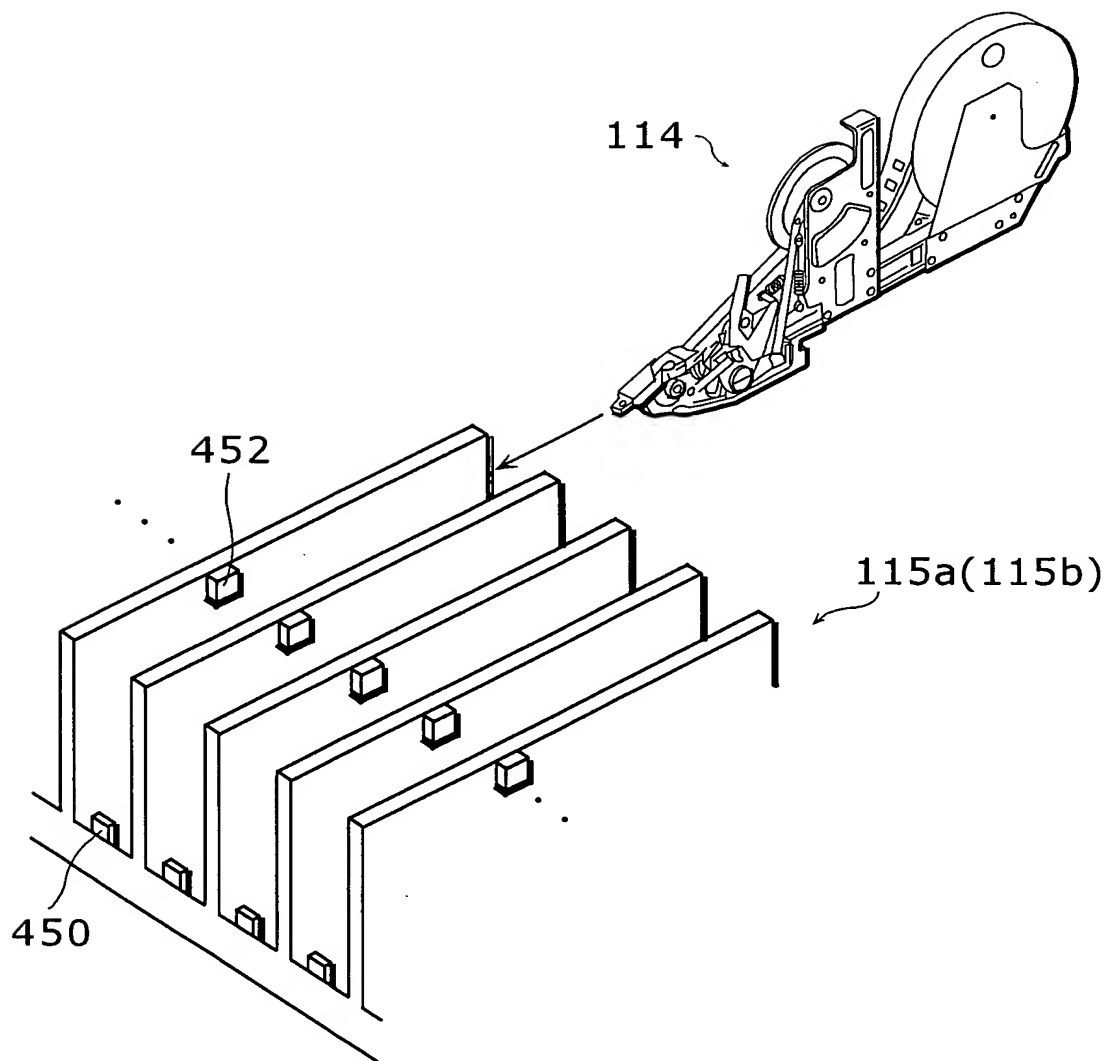


FIG. 16

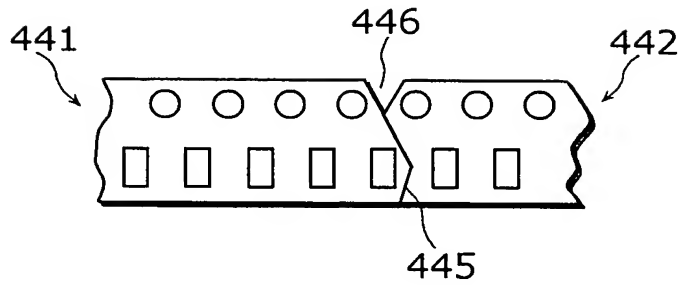
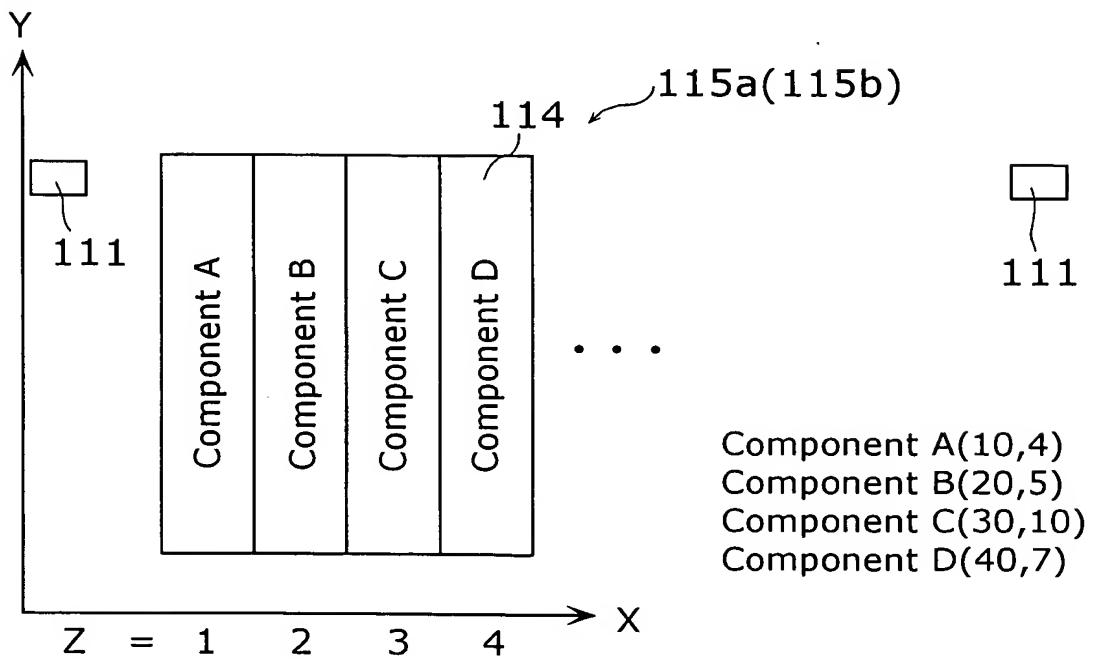


FIG. 17



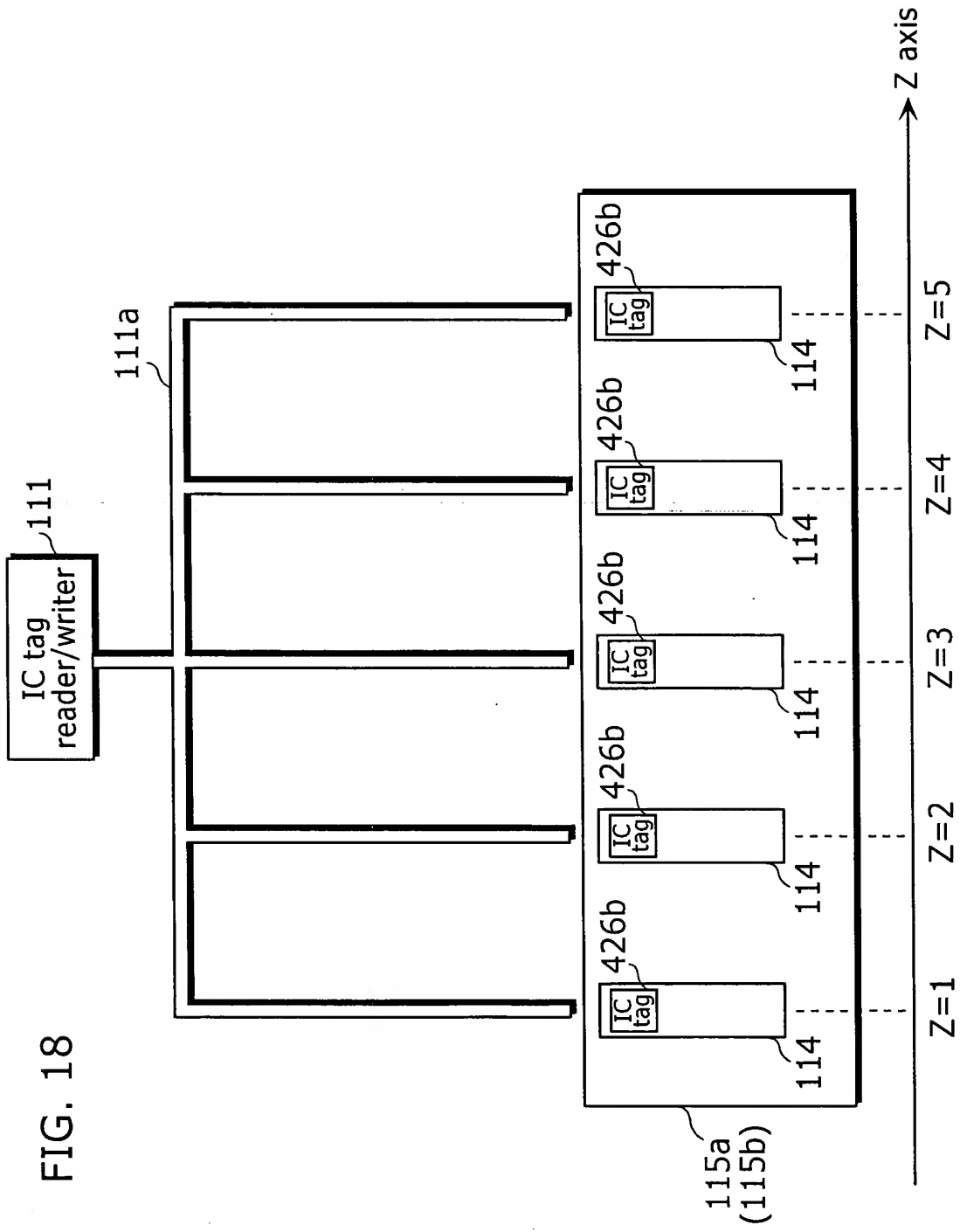


FIG. 19

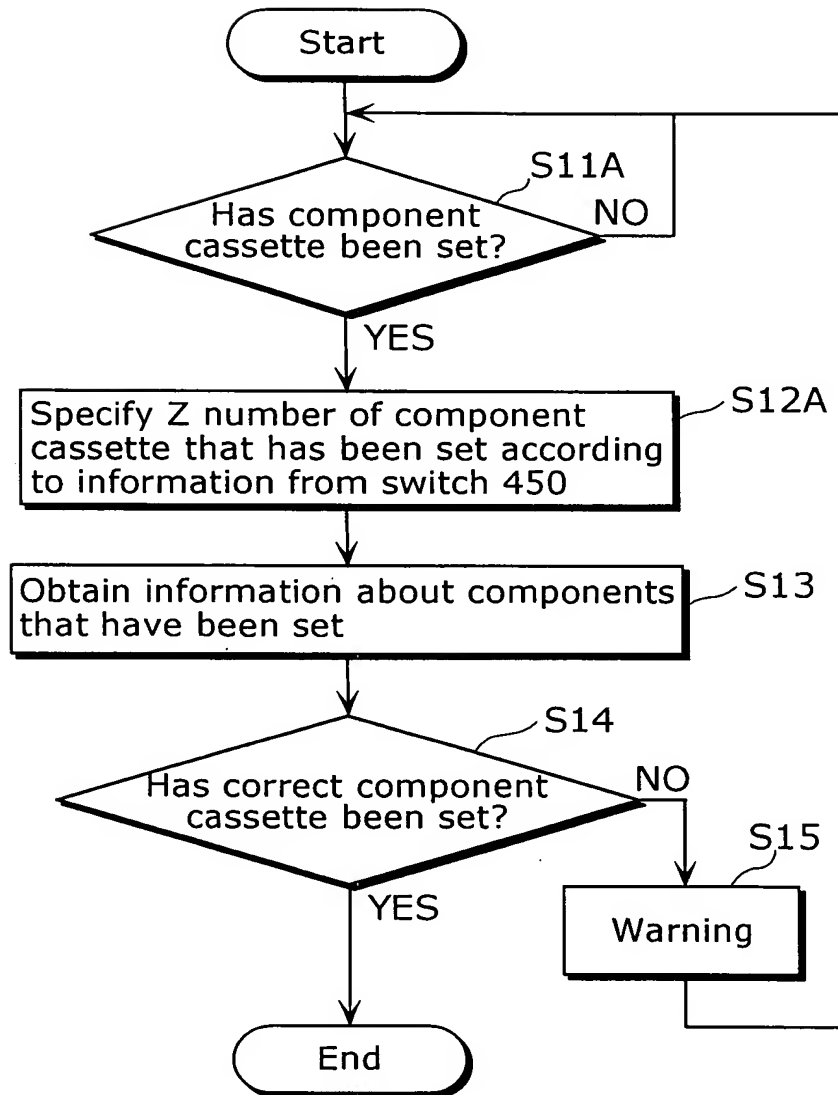


FIG. 20

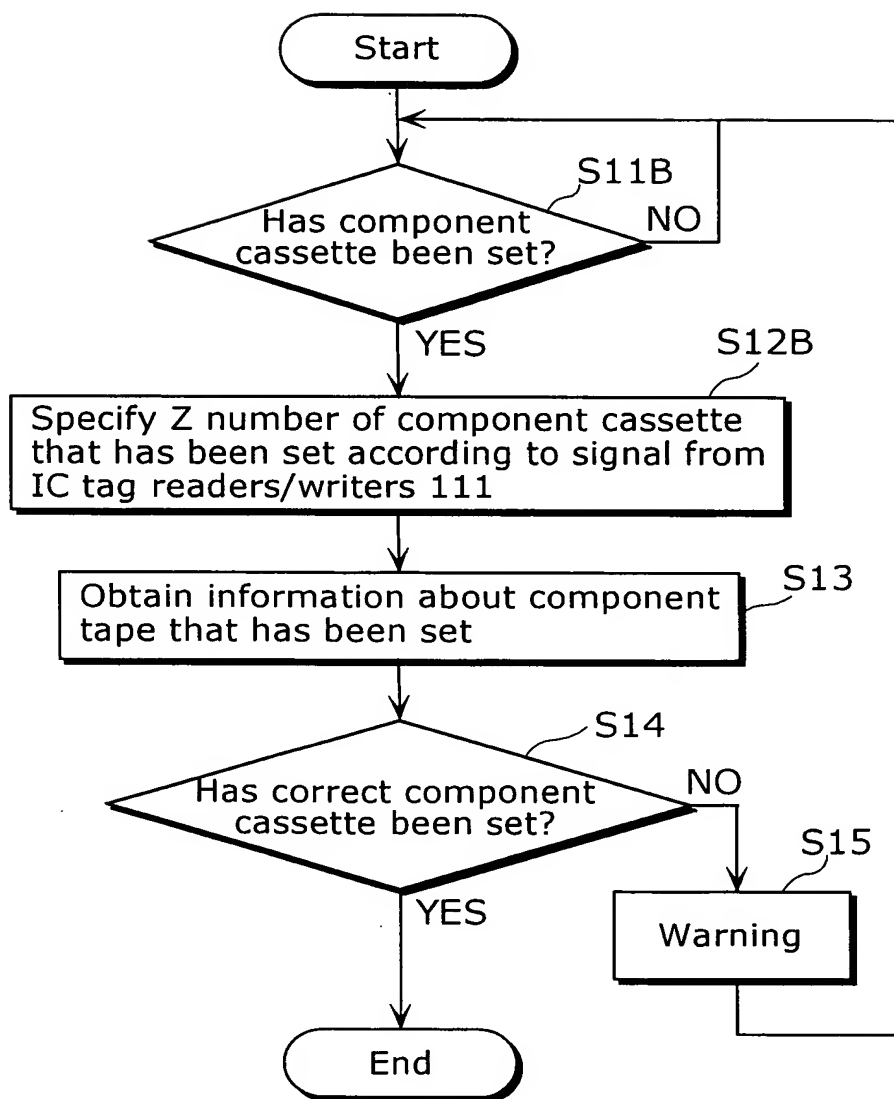


FIG. 21

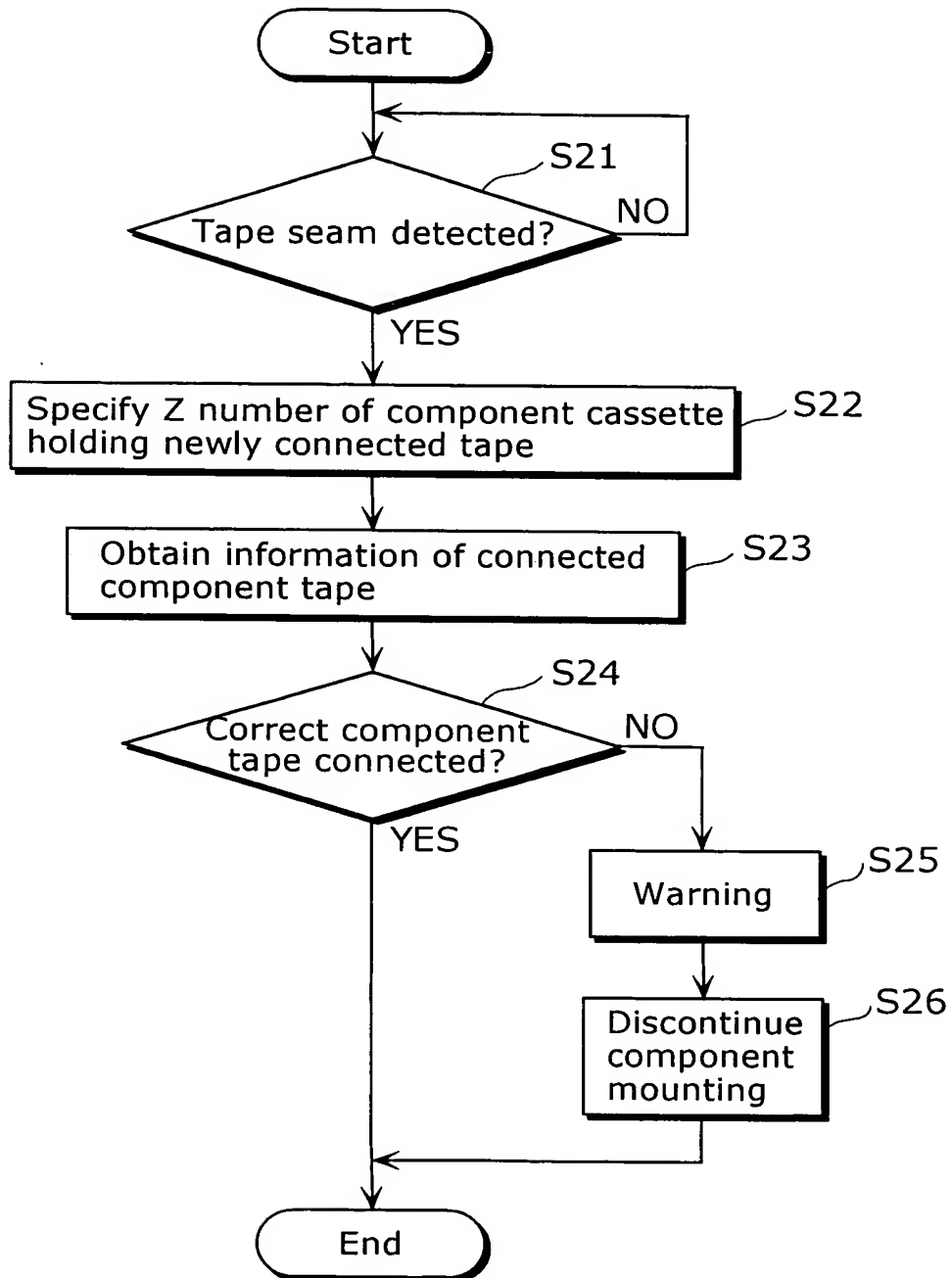


FIG. 22

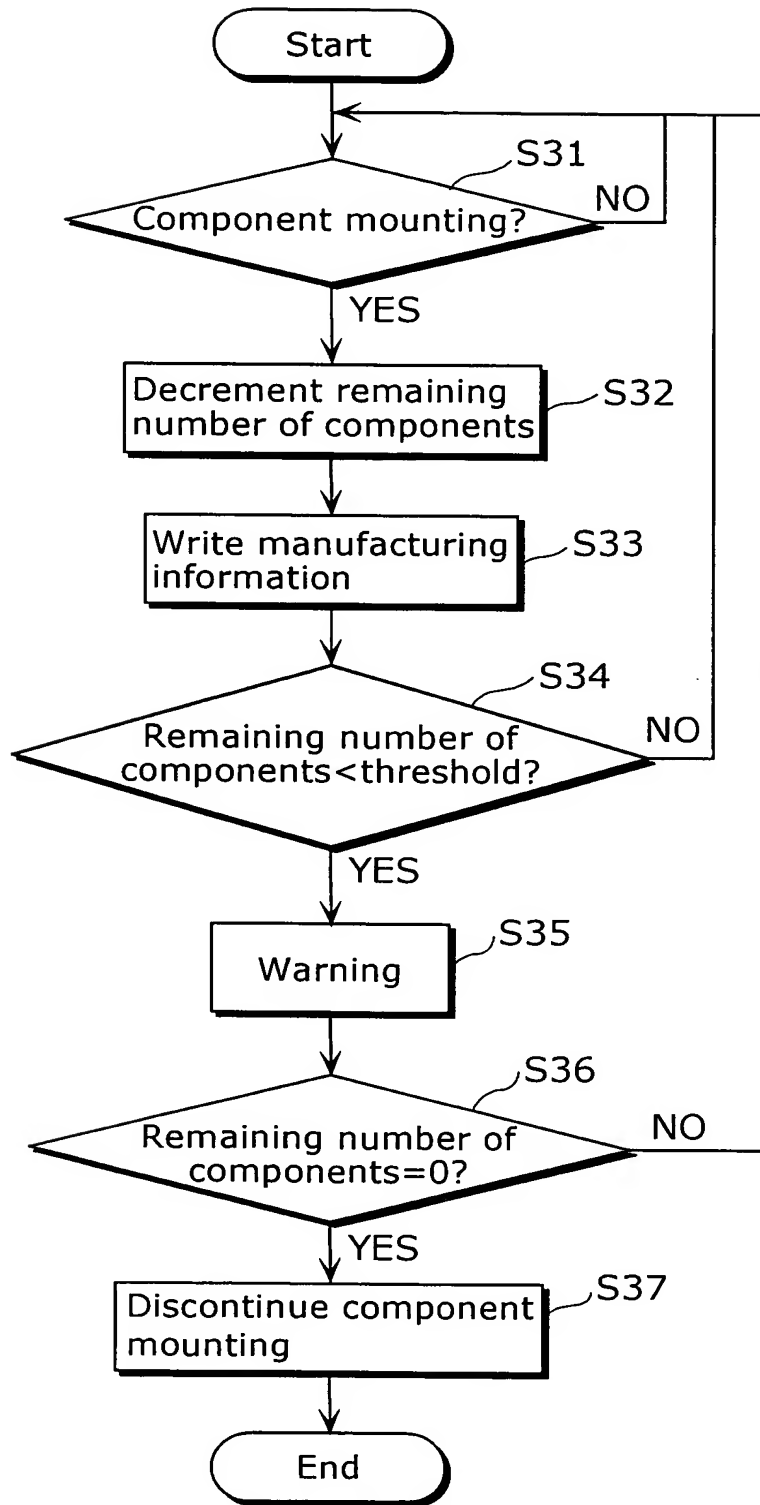


FIG. 23

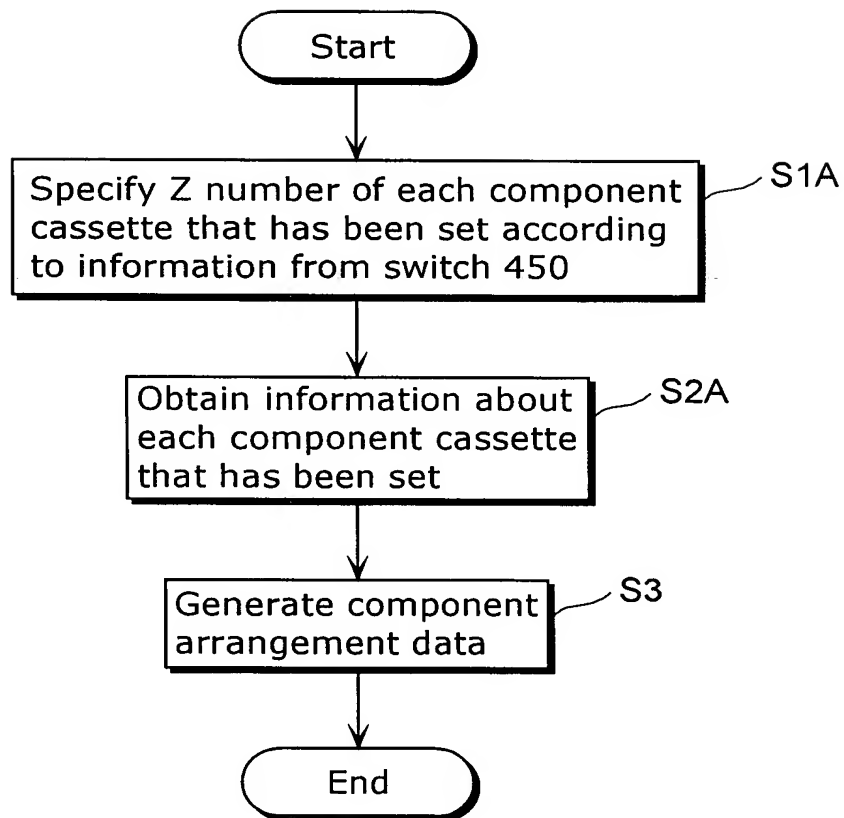


FIG. 24

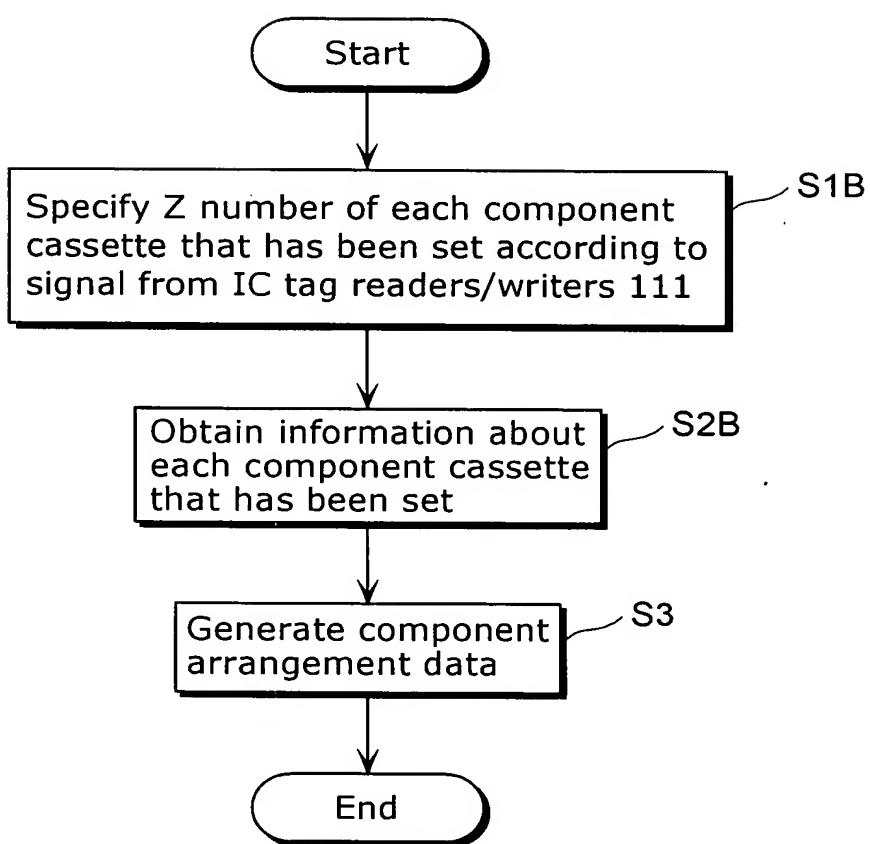
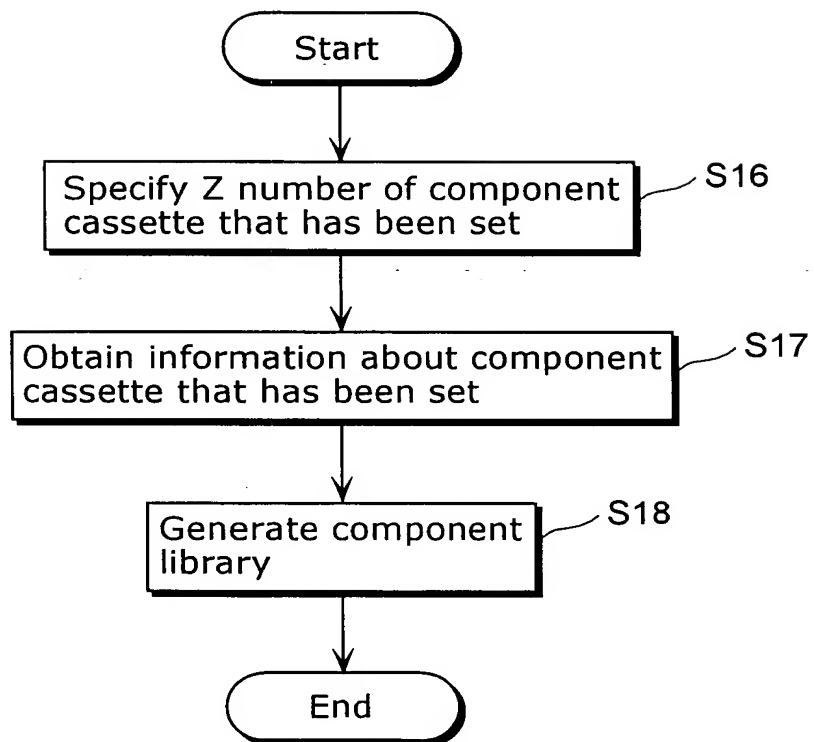


FIG. 25



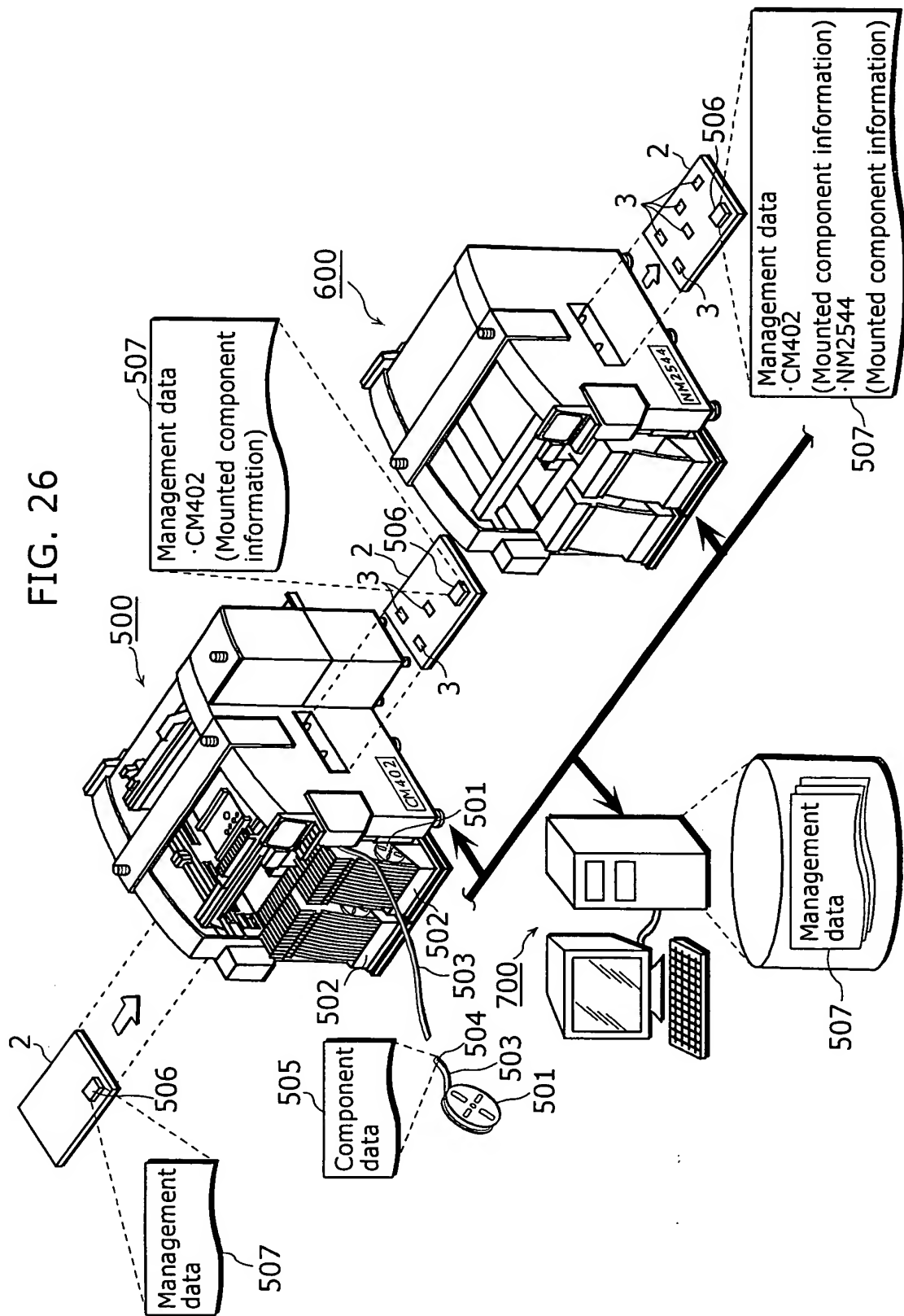
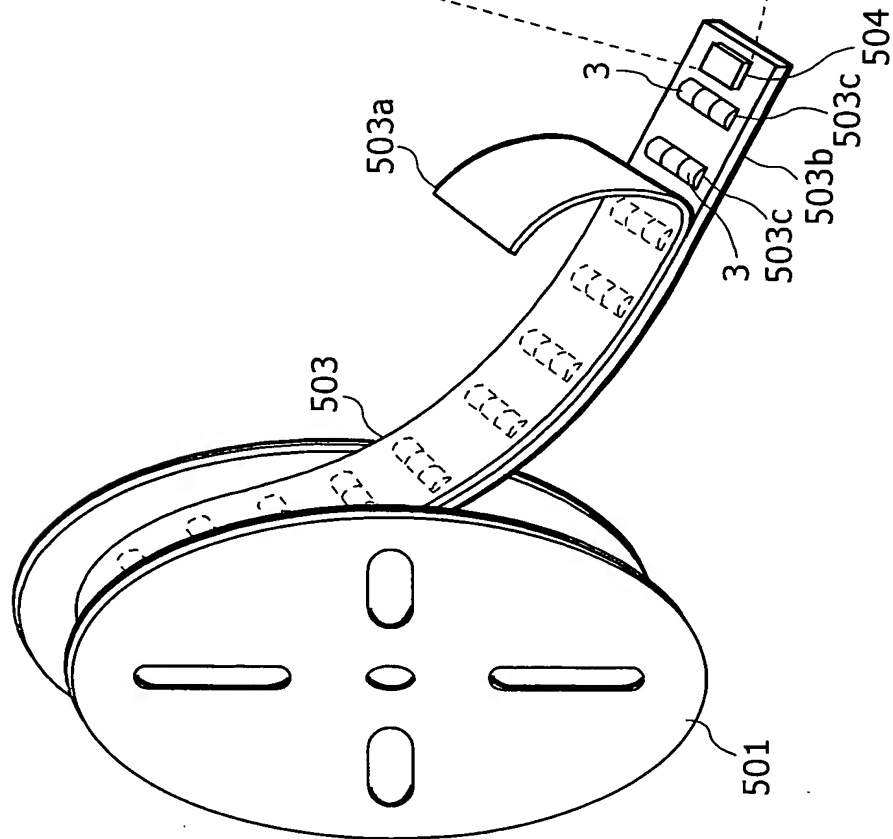


FIG. 27



Component data 505

A1	Serial number	ser0001,..., ser0500	
A2	Lot number	lot0002	
A3	Component name	1005C.R	
A4	Vendor code	ven0003	
A5	Shape	Width(mm)	10
		Depth(mm)	5
		Height(mm)	2
A6	Manufacturing date	2002/01/31	
A7	Opened date	2003/02/01	
A8	Number of components	500	
A9	Pitch(mm)	10	
	:	:	

FIG. 28A

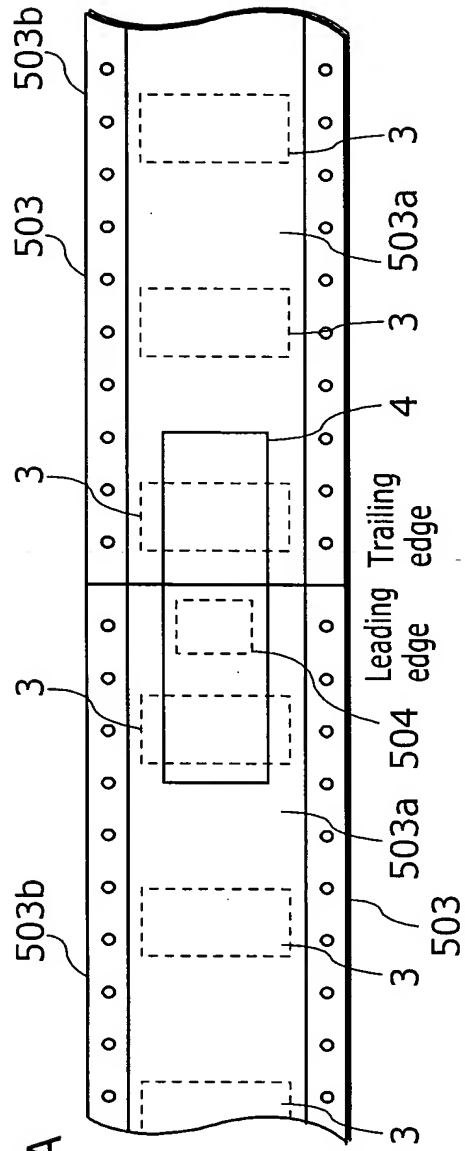


FIG. 28B

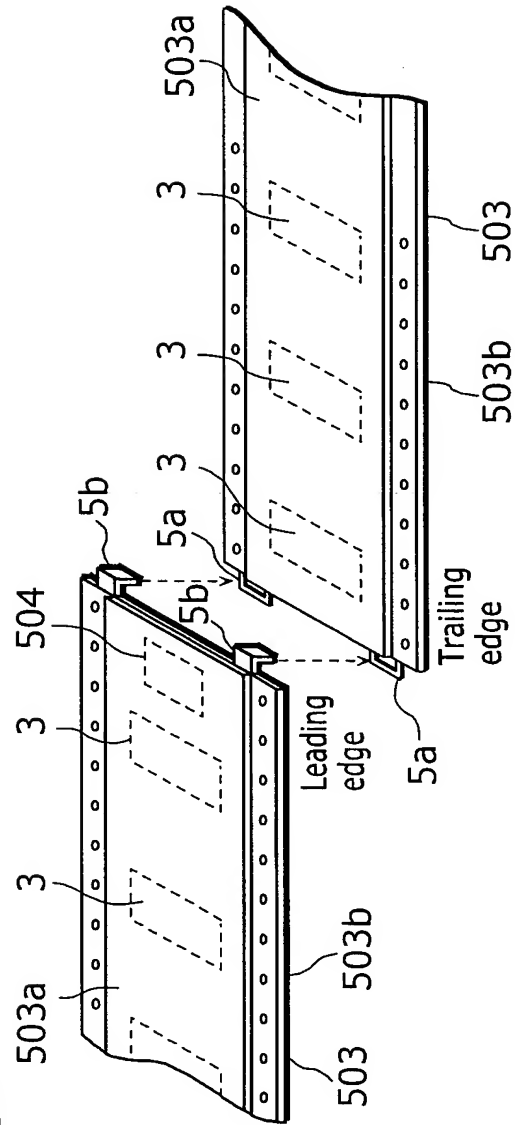


FIG. 29

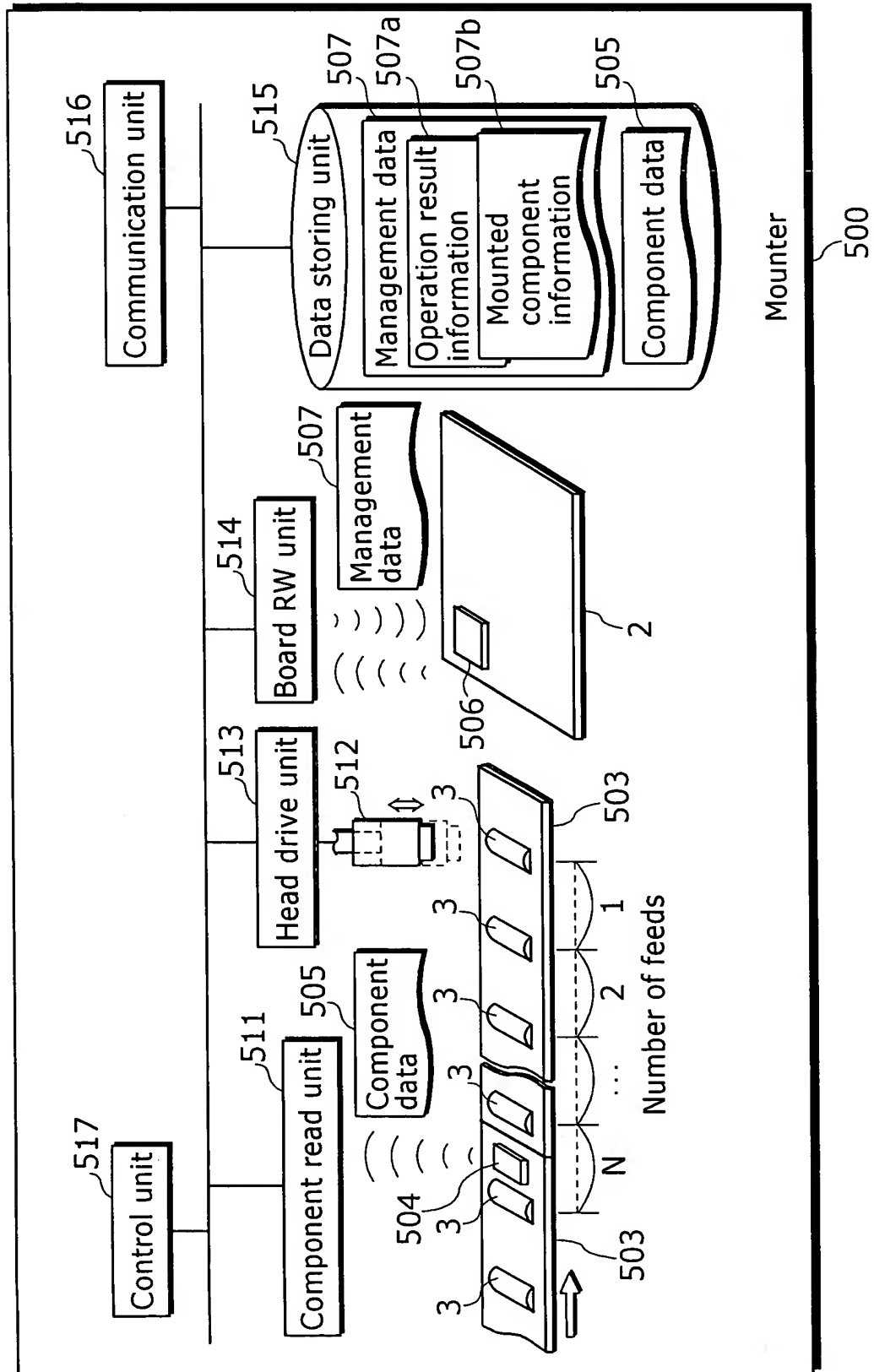


FIG. 30

Board ID:PB01ID/ Lot number:PB01Rt				B3		B4	B5			B6		Operation result information 507a
B1	B2	Date/time of insertion	Tact time	PG	Date/time of occurrence	Error		Code	Step	Index		
Machine name												
CM402		2003/01/06 11 : 16 : 34	35 sec	PTESTA	2003/01/06 11 : 16 : 55			MC0005	100	Idx 01		
NM2544			
:			

FIG. 31

Mounted component information 507b

Index:Idx03				
Index:Idx02				
Index:Idx01				
C1	C2	C3	C4	C5
Position	Component name	Serial number	Lot number	Z-axis
X1, Y1	1005C.R	ser0001	lot0002	10
X2, Y2	1006C.R	ser0002	lot0003	11
X3, Y3
⋮

FIG. 32

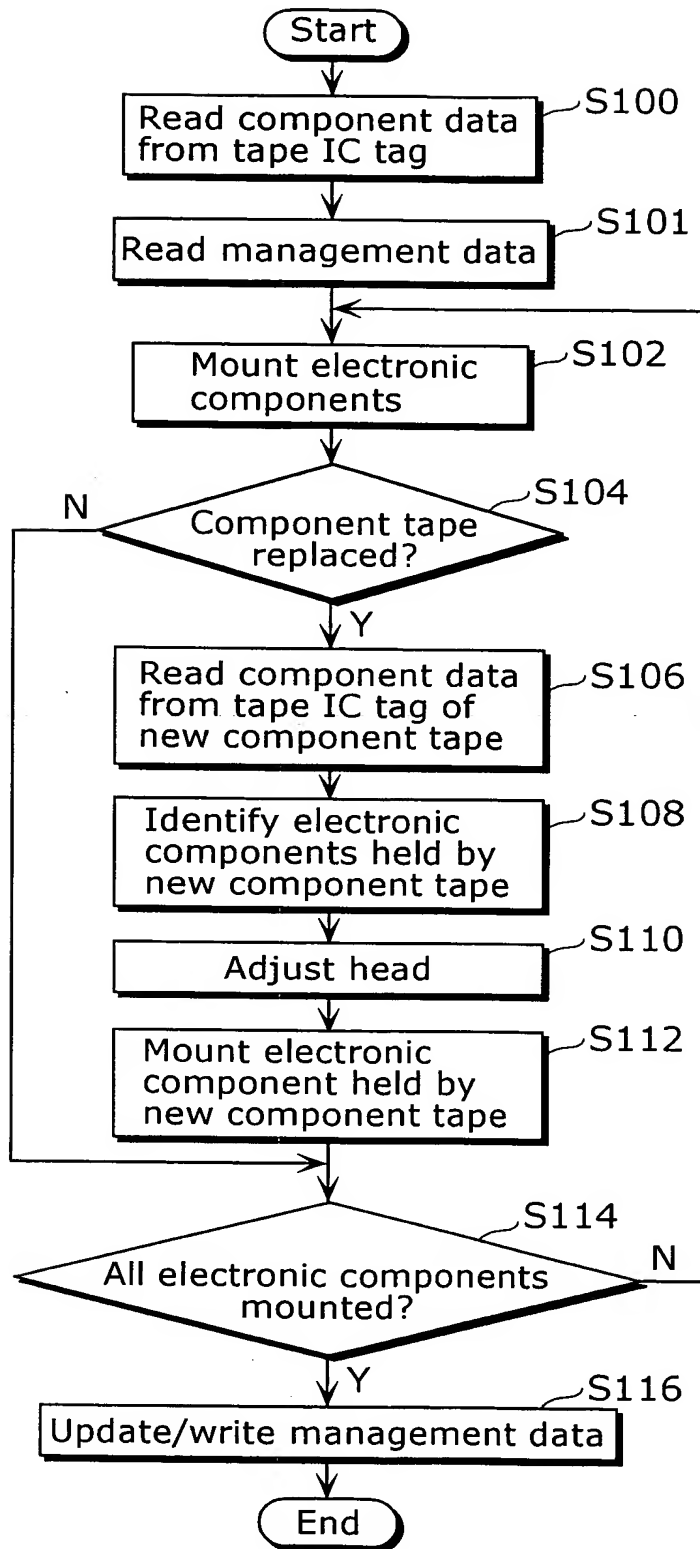


FIG. 33

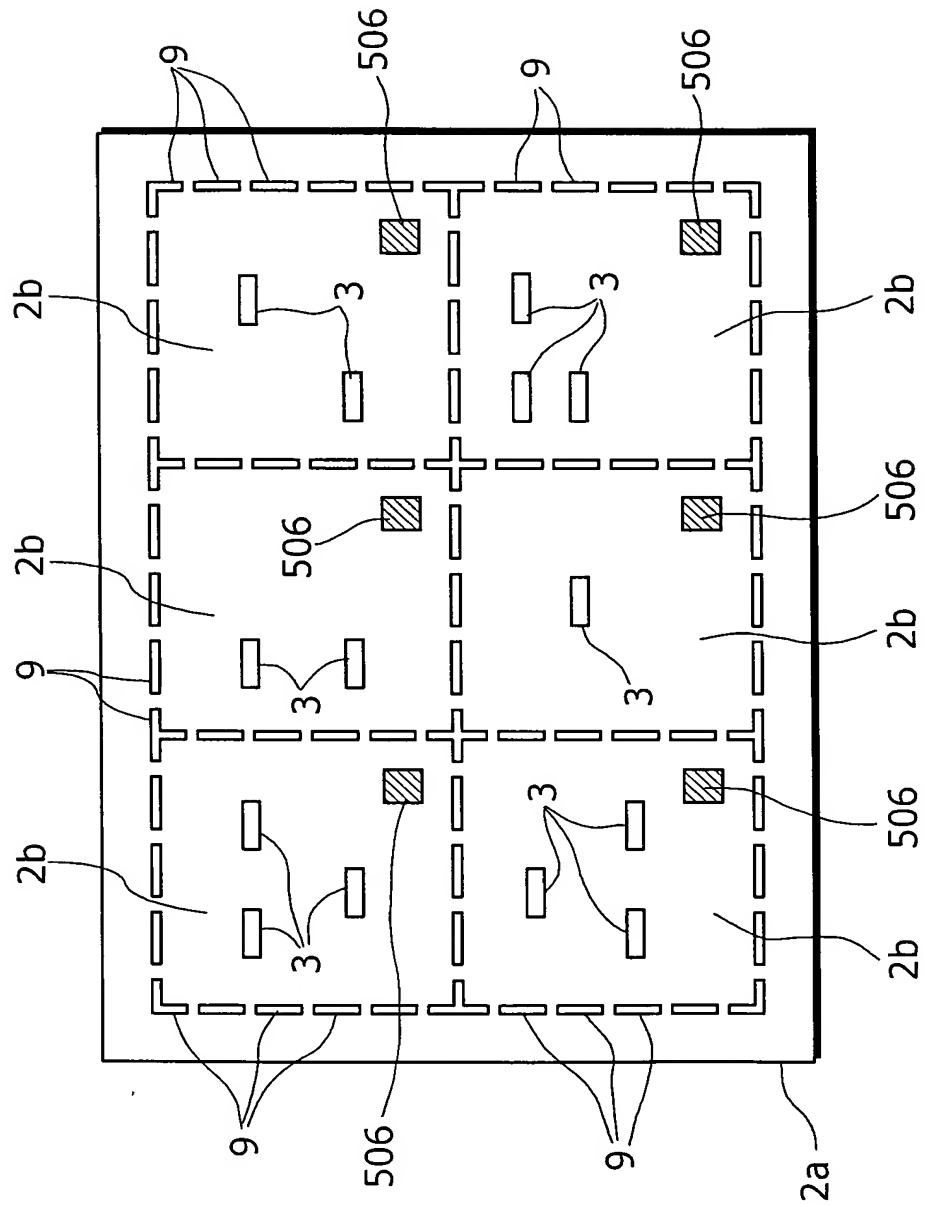


FIG. 34

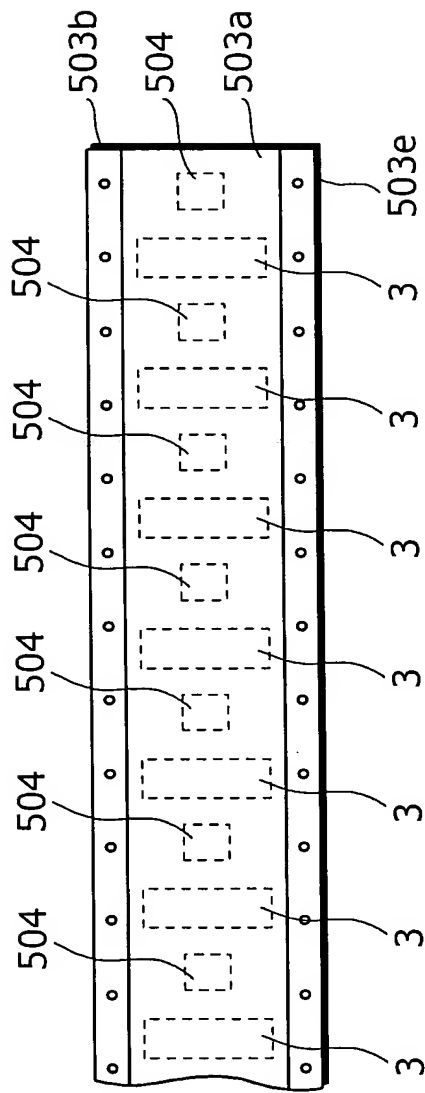


FIG. 35

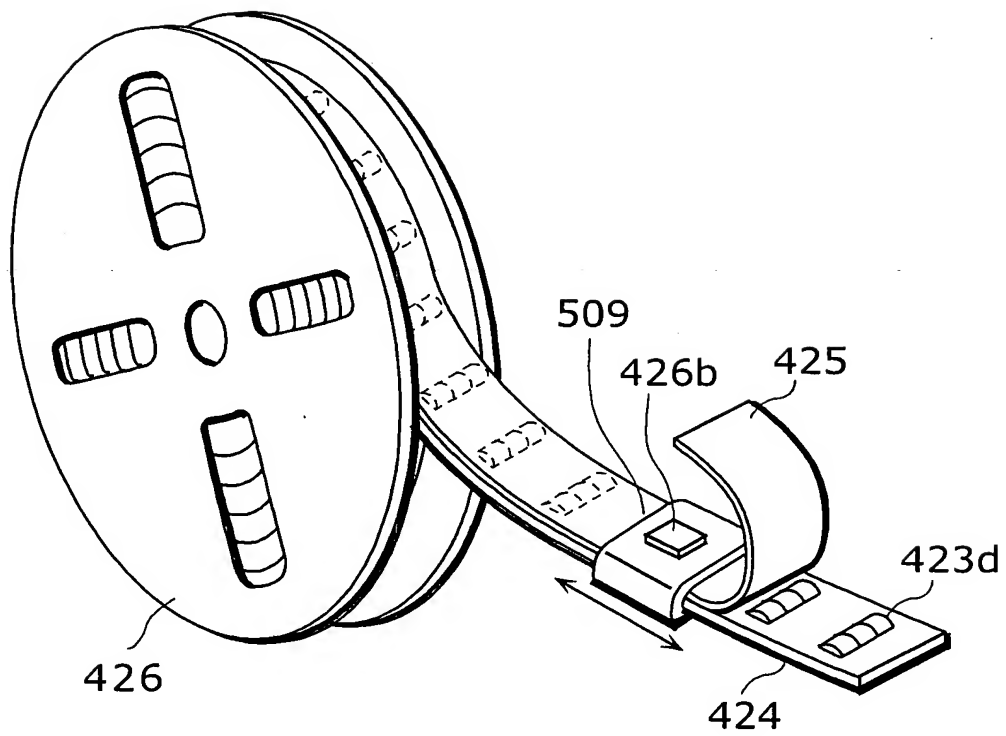


FIG. 36

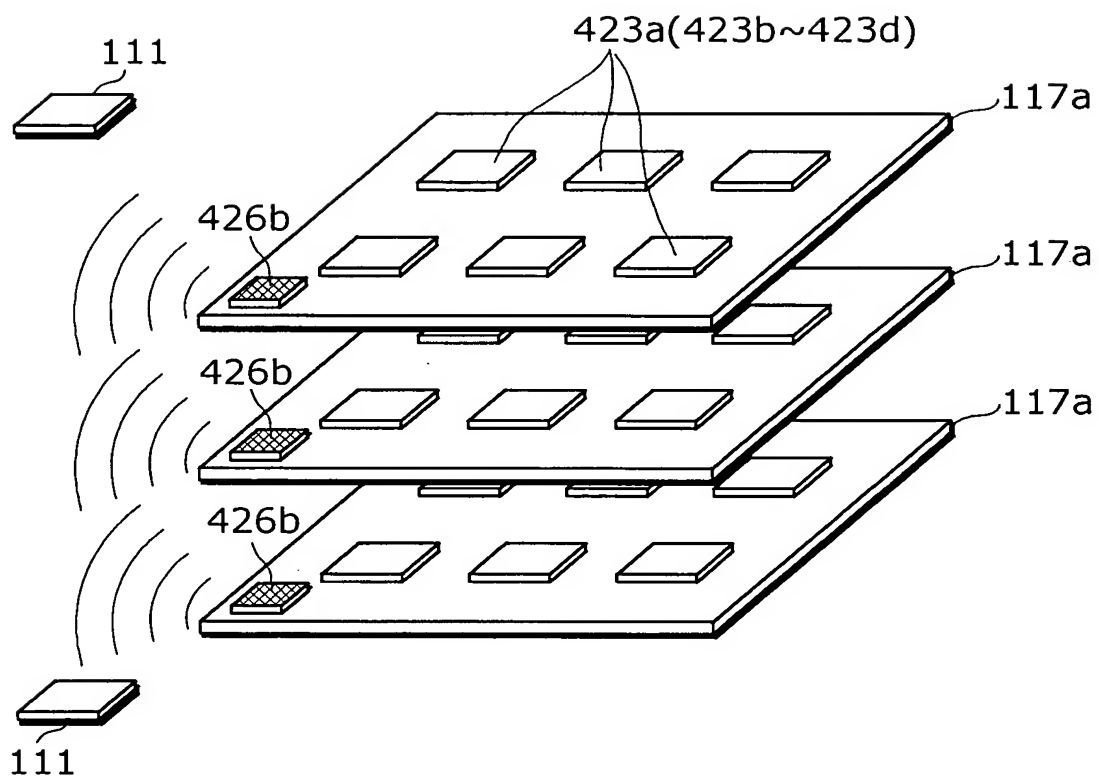


FIG. 37

